MULTIFUNCTIONAL MAGNETIC NANOPARTICLE PROBES FOR MOLECULAR IMAGING

Abstract

The present invention provides multifunctional magnetic nanoparticle probe compositions for molecular imaging and monitoring, comprising a nucleic acid or polypeptide probe, a delivery ligand, and a magnetic nanoparticle having a biocompatible coating thereon. The probe compositions may further comprise a fluorescent or luminescent resonance energy transfer moiety. Also provided are compositions comprising two or more such multifunctional magnetic nanoparticle probes for molecular imaging or monitoring. In particular, the nucleic acid or polypeptide probes bind to a target and generate an interaction observable with magnetic resonance imaging (MRI) or optical imaging. The invention thereby provides detectable signals for rapid, specific, and sensitive detection of nucleic acids, polypeptides, and interactions thereof *in vivo*.

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